older theories of light and color perception are illogical, not based upon experiment, and mutually destructive. Each and all are founded on the fallacy of the specific or differentiating function of the retinal end-organs, a theory that in other departments of physiological inquiry has been thrown aside. The authors consider the office of the retina in this respect to consist simply in the reception of the ethereal stimuli by the pigmentary layer into which the points of the rods and cones extend, and a transformation of the ethereal wave energies into its own molecular activity to heights or degrees precisely correspondent to the amplitudes or energies of the ethereal vibrations. The rods and cones register the height of this aroused molecular energy, and transfer by ordinary neural methods these registrations to the cerebral coördinating centres, where alone light and color are produced. The authors examine in detail arguments and corroboratory data drawn from the sciences of physics, physiology, chromatology, psychology, and pathology, but reliance is placed especially upon the physical law that the kinetic value of the ethereal stimuli can only become mechanical or neural in setting up molecular activity in particles of which the vibratory period is consonant with their own. The absolute energy of the ether-wave is too slight to produce work in any other manner. If this be so, they say, our measure of molecular activity is always in terms of heat-units; heat or temperature is the common name for such motion. It appears that this ingenious theory was worked out in ignorance of the fact that others had previously and tentatively advanced the same fundamental hypothesis—notably Swan M. Burnett, who, so long ago as 1881, rightly judges that a consensus of investigators arriving independently at a common understanding, argues a fatal defect in the older theories.

At first sight, the matter seems to possess only a purely theoretic or scientific interest, but, as is suggested, there is no truth once established but finds unexpected practical applications, and it is not difficult to see that experiment and investigation on the lines opened out by this thought may lead to decidedly useful results in reference to color-blindness and various retinal affections.

## OTOLOGY.

UNDER THE CHARGE OF

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### THE ORGAN OF HEARING IN LEUCÆMIA.

DR. GIUSEPPE GRADENIGO, JR., of Padua (*Archiv für Ohrenheilkunde*, Bd. 23, S. 242–263, July 15, 1886), has contributed an interesting brochure on this subject. The only case of profound affection of the organ of hearing, in consequence of leucæmia, heretofore fully described, both clinically and pathologically, is that of Politzer, presented at the Otological Congress, at Basle, in 1884. The other cases reported are given in their clinical aspects only.

According to the statistics of Vidal and Isambert, in ten per cent. of the cases of leucæmia there occur aural symptoms of a specific form. This percentage, however, is regarded by Gradenigo as perhaps too high. It is also very probable that aural affections are not as numerous as ophthalmic diseases in leucæmia.

The observations of Gradenigo were made upon a leucæmic subject with splenic disorder, who, in the last days of his life, manifested undoubted signs of hardness of hearing. His case was one of mixed leucæmia, with hemorrhagic diathesis, petechiæ upon the backs of the hands, hemorrhages from the bowels, and epistaxis. There were alterations in hearing in both ears, and death occurred from exhaustion. After obstinate epistaxis, which lasted for eight hours, occurring after the patient had been under observation for two weeks in the hospital at Padua, he experienced tinnitus aurium. Ten days later there was noted considerable hardness of hearing in both ears, which had been developed within a few hours. Two days subsequent to this the tuning-fork was perceived only when placed on the skull. The watch was heard only when placed on the auricle. In the left ear, whispering, 0; conversational tone heard 10 centimetres. In the right ear, whispering, 0; conversational tone, 15 centimetres.

After catheterization of the right Eustachian tube there was entire cessation of the noises in that ear, and an increase of hearing for the watch to 8 centimetres. Two days later, the patient complained of hearing worse, especially in the left ear. Inspection of the left ear revealed the presence of a grayish-red mass, extending across about one-third the lumen of the auditory canal. Syringing removed numerous red layers of epidermis, and a small clot of blood. A closer inspection showed that the aforesaid mass consisted of a subepidermal vesicle, containing fluid and coagulated blood, situated on the lower end of the canal, and stretching toward both the anterior and posterior level. This vesicle began about the middle of the cartilaginous part of the auditory canal and extended almost to the edge of the membrana tympani. The latter was reddened and swollen, the short process being the only part of the malleus remaining visible. The membrana tympani was greatly retracted, and its lower half appeared brownish in color, without distinctly defined outline, as though there were in the drum-cavity a blood-clot. In the right auditory canal there was a dark red, hemorrhagic spot on the anterior wall.

The diagnosis now made was "Otitis media chronica bilateralis, with recent hemorrhagic exudation in the external and middle ear."

During the subsequent few days there were epistaxis, evanescent petechiæ on the belly, and a gradual loss of strength. The deafness, however, seemed to diminish markedly. Death occurred in six weeks, being preceded by a recurrence of hemorrhagic diarrhœa.

Post-mortem examination of the drum cavities revealed in them the presence of a gelatinous yellowish-red substance which filled these cavities, and extended backward and toward the mastoid cells. The fluid pressed from this mass showed, under the microscope, both red and white blood-cells, varying in size, but containing no crystals of cholesterin or fat cells. The mass disappeared in fibrous texture. Further and later examination revealed the presence of new-formed connective tissue, containing hemorrhagic infiltration and remnants of free extravasations. The examination of the internal ear gave a negative result, so far as concerned the presence of a leucæmic exudation.

The results of Gradenigo's investigations are summed up as follows:

1. In the course of a leucæmic process there sometimes occur in the organ of hearing complications which depend upon exudative processes in the middle ear or in the internal ear.

2. Such exudations may ensue independently of a hemorrhagic diathesis.

3. Either a previous or a simultaneous inflammatory process must be regarded as the essential predisposing factor in the aural complications.

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### ABSCESS OF THE BRAIN FOLLOWING OTORRHŒA—CURED BY OPERATION.

The patient, in this instance, was under the surgical care of Dr. Schede, in the General Hospital of Hamburg. The notes were collected by DR. MAX TOEPLITZ, and published in the *Archives of Otology*, Sept. 1886, vol. xv. pp. 176–185. In this case, as in that of Schondorff, alluded to by the writer (*Monatsschr. f. Ohrenheilk.*, 1885, No. 2), there was a well-defined, very painful spot on the skull, œdema confined to the same limit, and a fistula. The fistula, in Toeplitz's case, led no further than under the scalp (galea) into a rough place on the outside of the bone, while in Schondorff's case it led directly to the brain, and indicated the way by which pus had escaped. It is asserted that Schondorff's case is the only other one reported cured.

The patient, a man, twenty-eight years old, had had a suppuration from his left ear for six months preceding his entrance into the hospital, January 11, 1885. His hearing had gradually decreased, and he began to look icteric. He complained of a painful spot on the top of the head; formerly he had had vertigo; a chill four days previous. The auditory meatus was narrowed to a small transverse fissure; at the fundus the field was red, shining, and protuberant. Incision into the meatus and the red protuberance at fundus. Patient had a pyæmic appearance. Treatment of the ear after incisions was by syringing and dressings of lead-water.

*Jan.* 13. The dressing contained a small quantity of fetid pus. The subjective symptoms were good. Remission of headache, but the temperature rose. Treatment: Sulph. quin., 0.5 gr., in three doses.

*14th.* Dressings are dry. Pain again on top of the head and in the occiput. On account of the rise in temperature, Dr. Schede opened the mastoid by chiselling off the cortex, which was thickened by hyperostosis. After reaching a depth of five millimetres, thick, cheesy, offensive pus escaped from the cavity, on a line with the linea temporalis, about one and a half centimetres behind the external meatus. Syringing through the external meatus brought away large pieces of cholesteatomatous pus through the opening in the mastoid. Drainage was maintained, and the wound packed with iodoform gauze. The dressings were changed daily.

*16th.* The wound looked well and there was no febrile reaction. The fever remitted. The subjective symptoms were good.

*24th.* The evening temperature 38.6° C., with moderate pain between vertex and temple. The dressings were changed and the wound syringed through the external meatus.

*27th.* A notable elevation in temperature to 39.6° C. The dressings covered with fetid pus. The wound filled with fresh granulations; the latter were removed to facilitate syringing.

*28th.* Temperature continues high. The opening in the mastoid was enlarged and energetically syringed; a thin strip of gauze was then inserted into the wound.

*29th.* Paresis of the *right* half of the face appeared over night, and the right angle of the mouth hung down obliquely; the tongue, when projected, deviated to the right and trembled. The patient was unable to contract his lips. Fluids were taken without difficulty. Both eyes were closed with equal facility. The patient showed a peculiar impediment of speech, using but few words, saying mostly "yes" and "no," mixing right words with erroneous ones, and reading in a stuttering voice; a word impulse which pleased once, would return repeatedly in his talk; his memory became defective, and he forgot his children, his name, and his age.

*30th.* High degree of aphasia. Dressings changed morning and evening. Syringing with 1:1000 sublimate solution. The bandages were now always wet through with pus. There was now observed slight œdema behind the ear, which greatly increased the next day.

The diagnosis of *brain abscess* was then made, and preparations for an operation instituted. The incision for chiselling the mastoid was extended upward about eight cm., and slightly backward. After detaching the galea and its periosteum, there was found, about three cm. behind and above the external auditory meatus, a drop of pus, "the size of a pin's head," protruding from a small fistula in the bone. After chiselling off an extremely thin and fragile piece of bone the size of a quarter, the dura was seen to be covered with red, button-like granulations. Pressure revealed distinct fluctuation. An exploratory puncture was made, which, however, resulted in the escape of only a trace of fluid with brain-fibres. At the same time, pieces of caseous matter, exceedingly offensive, came away continually from between the dura and the bone, and also small quantities of foul air. The incision was then extended downward and backward five cm., and the thin bone was further chiselled off. Again large quantities of pus were discharged, thinner than before, but equally offensive. An exploratory puncture at this point disclosed the presence of pus. After slitting the dura, about a cupful of pus escaped, and the sharp spoon (used as probe?) entered six cm. without reaching the wall of the abscess. The abscess was about the size of a small orange. Syringing with sublimate solution (1:1000) brought out a quantity of matter interspersed with flakes of brain-matter. Drainage of the cavity of the abscess was maintained, and dressed with sublimate gauze. The partly narcotized patient was able now to move the left orbicularis muscle, but not the right one. The patient passed the first few days almost entirely in sleep, then recovered rapidly, the fever having ceased. The impediments in speech did not quickly abate. Dressings always contained fetid pus in abundance.

*Feb.* 11. The patient up at his own request, and becoming more active. A slight weakness of his left leg passed off rapidly; speech improved.

*12th.* Drainage tube removed. A round spot of the dura mater, one and a half inches in diameter, was bulging and visibly pulsating.

*19th* to *21st.* Vomiting after meals. Pulse only 60. Patient became dull, assumed a pyæmic appearance, and seemed collapsed at night.

*22d.* A portion of the dura, the size of a hazelnut, bulged outward, and was very resistent to pressure. After an incision, upward and backward, a quantity of thin, fluid, very fetid pus issued from this region.

Temperature remained normal, the patient recovered rapidly, and his physical functions reappeared. He quickly tired, however, after reading, writing, and, especially, ciphering.

*March* 23. Discharged from the hospital, and treated as an out-door patient. In two months he returned with fever. The abscess was again opened and drained. After a week's drainage, the patient got up and left the hospital, cured. The wound healed completely in about three weeks. As late as October 16th, five months subsequent to this treatment, though he spoke fluently, the patient was unable always to recall a word promptly when desiring to use it.

It is remarked that the abscess was probably situated in the region of the second left temporal convolution. The diagnosis was based, 1, upon the œdema confined to the region already named; 2, upon the painfulness which existed there, and which became very great on pressure; 3, on the paralysis of the right facial nerve, and upon the peculiar impediment in speech.

The diagnosis is difficult, as some features are common to all three above-named conditions. A differential diagnosis is aided by the fact that meningitis generally begins suddenly. High fever, delirium, vomiting, stiffness of the neck, are then developed in meningitis, whilst symptoms of abscess in the brain come on slowly, on account of its frequently prolonged latency.

The symptomatic points in brain-abscess have already been given. Thrombosis in the lateral sinus is characterized by painfulness along the sterno-cleido-mastoid muscle, and especially by a swelling of the external jugular, which can be easily felt. Later, chills and high temperature may set in, great œdema of the throat develops, and paralysis of the vagus and glosso-pharyngeus is also described as likely to ensue.

## DERMATOLOGY.

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### THE TREATMENT OF LUPUS BY LOCAL APPLICATIONS.

As stated by UNNA (*Lancet*, Sept. 25, 1886), the fact that the mechanical treatment of lupus is rarely sufficient to ward off recurrence, is ample justification of experimental attempts to transform the treatment into one of medical application. In using salicylic acid plasters in lupus cases for the removal of the cuticle preparatory to the employment of more destructive